FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2023

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC19U PHY4 B04 / CC20U PHY4 B04 - ELECTRODYNAMICS - II

(Physics - Core Course)

(2019 Admission onwards)

Time : 2.00 Hours   Maximum : 60 Marks

Credit : 3

Part A (Short answer questions)
Answer *all* questions. Each question carries 2 marks.

1. State Ohm's law with equation.

2. What is the quantity equivalent to H in electrostatics? Explain why.

3. Write down Maxwell's equations in free sapce.

4. What is meant by polarisaiton of a wave?

5. State Poynting theorem.

6. Explain Lorentz gauge.

7. What is meant by single energy transients?

8. Explain how LCR circuit can be used for tuning purposes.

9. Define power factor in AC circuits.

10. Explain an ideal current source and an ideal voltage source.

11. State Reciprocity theorem.

12. State maximum power transfer theorem.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)
Answer *all* questions. Each question carries 5 marks.

13. Find the self inductance per unit length of a long solenoid of radius a, carrying N turns per unit length.

14. Write a short note on Maxwell's equations.

15. Obtain an expression for average power dissipated per unit volume of an electromagnetic wave.

16. A circuit containing L,C and R with L = 0.2H and R =100Ω.When the circuit is critically damped,what is the value of C?

17. The resistance of a ballistic galvanometer is 125 ohms.A steady p.d of 0.0003 volt gave a deflection of 16 cms. The system was undamping and the period was 10s.When a condenser was discharged through the galvanometer,the throw was 5 cms. Find the charge.

18. How does an LCR circuit make oscillations?

19. With an example show how Kirchoff's laws are used to analyse electrical circuits.

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any *one* question. The question carries 10 marks.

20. Explain how Maxwell modified Ampere's law. Derive the Maxwell's equation inside a polarised matter.

21. A plane polarized monochromatic wave of angular frequency ω passes normally through the boundary between two linear dielectrics. Find the expressions for the transmission and reflection coefficients.

(1 × 10 = 10 Marks)

****